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HOSKINS-WESTERN-SONDEREGGER INC LINCOLN NE
NATIONAL DAM SAFETY PROGRAM. FAYETTE NEW CITY LAKE DAM (MO 1013--ETC(U)
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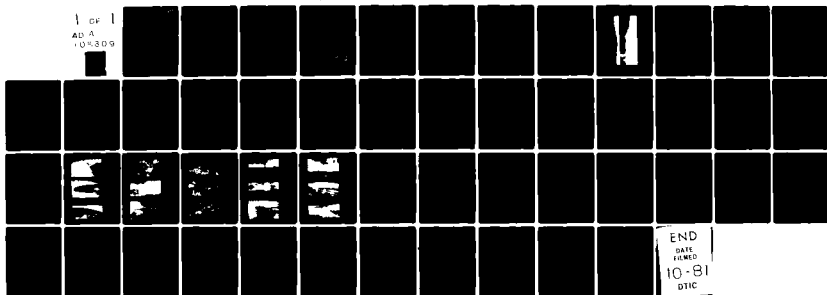
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MISSOURI-KANSAS CITY BASIN

FAYETTE NEW CITY LAKE DAM

HOWARD COUNTY, MISSOURI

MO 10130

AD A105309

**PHASE 1 INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM**

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PREPARED BY: HOSKINS-WESTERN-SONDEREGGER, INC.

FOR: STATE OF MISSOURI

SEPTEMBER, 1978

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DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
210 NORTH 12TH STREET
ST. LOUIS, MISSOURI 63101

IN REPLY REFER TO

SUBJECT: Fayette New City Lake Dam (Mo. 10130), Phase I Inspection Report

This report presents the results of field inspection and evaluation of the Fayette New City Lake Dam (Mo. 10130).

It was prepared under the National Program of Inspection of Non-Federal Dams.

This dam has been classified as unsafe because of through seepage near the left abutment, ponding, and a large unexplained hole downstream of the dam.

SUBMITTED BY: SIGNED 15 MAR 1979
Chief, Engineering Division Date

APPROVED BY: SIGNED 19 MAR 1979
Colonel, CE, District Engineer Date

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PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
FAYETTE NEW CITY LAKE DAM
MO 10130

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PHASE I

NATIONAL DAM SAFETY PROGRAM

Name of Dam	Fayette New City Lake Dam
State Located	Missouri
County Located	Howard County
Stream	Tributary to Adams Fork
Date of Inspection	September 20, 1978

Fayette New City Lake Dam was inspected by an interdisciplinary team of engineers from Hoskins-Western-Sonderegger, Inc. The purpose of the inspection was to make an assessment of the general condition of the dam with respect to safety, based upon available data and visual inspection, in order to determine if the dam poses hazards to human life or property.

The guidelines used in the assessment were furnished by the Department of the Army, office of the Chief of Engineers and developed with the help of several Federal and State agencies, professional engineering organizations, and private engineers. Based on these guidelines, this dam is classified as an intermediate size dam with a high downstream hazard potential. Failure would threaten life and property. The estimated damage zone extends five miles downstream of the dam. Immediately downstream of the dam is Rogers Lake Dam (Mo. 10370). Rogers Lake begins approximately 1,000 feet downstream from the Fayette New City Lake Dam. Rogers Lake Dam is approximately $1\frac{1}{4}$ miles further downstream. Failure of Fayette New City Lake Dam would probably cause failure of Rogers Lake Dam. Within the downstream damage zone of Rogers Lake Dam are fifteen houses, three improved road bridges, one state highway bridge and one railroad bridge.

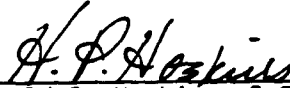
Our inspection and evaluation indicates that the spillway does not meet the criteria set forth in the guidelines for a dam having the above size and hazard potential. The spillway will pass the 100-year frequency storm and will just pass the storm equal to 50% of the Probable Maximum flood without overtopping the dam. The Probable Maximum Flood (PMF) is defined as the flood that may be expected from the most severe combination of critical meteorologic and hydrologic conditions that are reasonably possible in the region.

Seepage and stability analyses comparable to the requirements of the "Recommended Guidelines for Safety Inspection of Dams" were not available, which is considered a deficiency. These analyses should be obtained in the future.

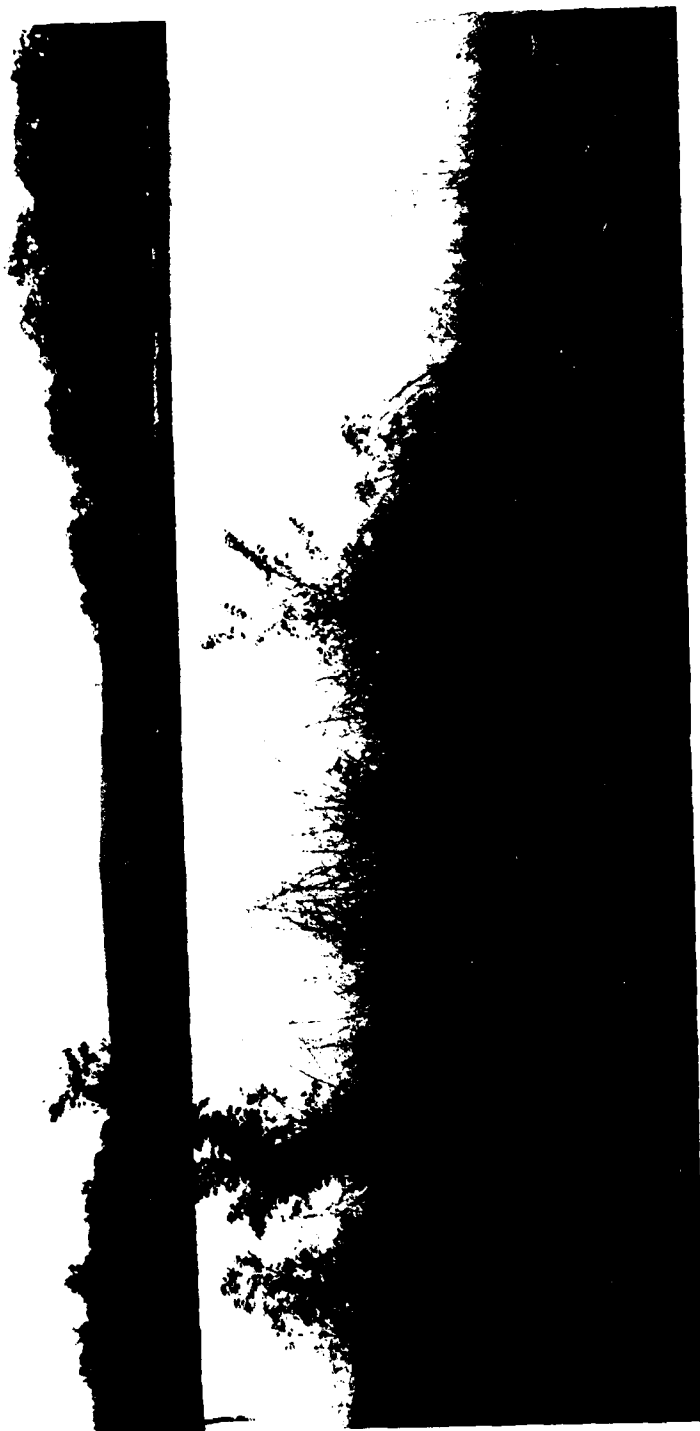
Other deficiencies visually observed by the inspection team were weeds, grass and bushes growing through the riprap on the upstream face; weeds, grass, many small trees and bushes covering the downstream face; erosion of the upstream face; seepage from the toe of the dam near the right spillway wall; seepage from approximate permanent pool elevation near the right spillway wall; possibility of seepage along the old stream channel; ponding of water near the downstream toe at the right abutment; inlet to the spillway nearly blocked with tree and brush growth; deterioration of the concrete in the ogee spillway section; horizontal cracks in

the concrete weir; a wire fence along the top of the weir which could collect floating debris and affect flow through the spillway; and open joints in the concrete exit channel.

Several items of preventive maintenance need to be initiated by the owner. These are described in detail in the body of the report.



Harold P. Hoskins, P.E.
Hoskins-Western-Sonderegger, Inc.
Lincoln, Nebraska



PHOTOGRAPH NO. 1
OVERVIEW

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
FAYETTE NEW CITY LAKE DAM - MO 10130
HOWARD COUNTY, MISSOURI

SECTION 1 - PROJECT INFORMATION

1.1 GENERAL

- a. Authority. The National Dam Inspection Act, Public Law 92-367, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a program of safety inspection of dams throughout the United States. Pursuant to the above, the St. Louis District, Corps of Engineers, District Engineer directed that a safety inspection of the Fayette New City Lake Dam be made.
- b. Purpose of Inspection. The purpose of the inspection was to make an assessment of the general condition of the dam with respect to safety, based upon available data and visual inspection, in order to determine if the dam poses hazards to human life or property.
- c. Evaluation Criteria. Criteria used to evaluate the dam were furnished by the Department of the Army, Office of the Chief of Engineers, in "Recommended Guidelines for Safety Inspection of Dams". These guidelines were developed with the help of several Federal agencies and many State agencies, professional engineering organizations, and private engineers.

1.2 DESCRIPTION OF PROJECT

- a. Description of Dam and Appurtenances.
 - (1) The dam is an earth fill about 650 feet in length and 35 feet in height. Topography adjacent to the site is moderately steep. Soils exposed on the slopes are lean clays (CL) derived from glacial till or from the underlying limestone and shale formations.
 - (2) The spillway is located on the left (north) abutment and consists of a concrete ogee weir and concrete chute.
 - (3) A 10 inch cast iron water supply line passes through the base of the dam near the right abutment.
 - (4) Pertinent physical data are given in paragraph 1.3 below.
- b. Location. The dam is located in the central portion of Howard County, Missouri as shown on Plate A2. The dam is shown on Plate A1 in the NW 1/4 of Section 4, T50N, R16W. The lake formed by the dam is shown in the NW 1/4 of Section 4, the NE 1/4 of Section 5, T50N, R16W and the SE 1/4 of Section 32, T51N, R16W.

- c. Size Classification. Criteria for determining the size classification of dams and impoundments are presented in the guidelines referenced in paragraph 1.1c above. Based on these criteria, this dam and impoundment is in the intermediate size category.
- d. Hazard Classification. Guidelines for determining hazard classification are given in the same guidelines referenced in paragraph c above. Discharges from this dam will flow into Rogers Lake immediately downstream. If failure of this dam could cause the failure of Rogers Lake Dam, this dam would be classed as High Hazard. The damage zone downstream from Rogers Lake Dam includes fifteen houses, three improved road bridges, one state highway bridge and one railroad bridge.
- e. Ownership. This dam is owned by the City of Fayette, 117 South Main Street, Fayette, Missouri 65248. Attention: Bobby Crowley, Superintendent of Water and Sewer Department.
- f. Purpose of Dam. The dam forms a 107 acre municipal water supply and recreation lake.
- g. Design and Construction History. No design or construction records were available for this dam. It was reportedly constructed in 1918. In 1961 the crest of the dam was raised 12 feet from elevation 730 to elevation 742.
- h. Normal Operating Procedures. This lake is used as a supplemental water supply for the City of Fayette. Withdrawal facilities are operated as needed. It was reported that flow through the spillway in 1973 caused some erosion at the lower end which was subsequently repaired with broomed concrete and surface grout.

1.3 PERTINENT DATA

- a. Drainage Area - 895 acres (1.4 square miles).
- b. Discharge at Damsite.
 - (1) All discharge at the damsite is through an uncontrolled reinforced concrete ogee type weir and spillway.
 - (2) Estimated maximum flood at damsite - unknown.
 - (3) The emergency spillway capacity varies from 0 c.f.s. at elevation 737.2 feet (top of ogee weir crest) to 2080 c.f.s. at elevation 741.2 feet (low point on dam crest and maximum pool level).

- c. Elevation (Feet Above M.S.L.).
- (1) Top of dam - 741.2 (low point), 742.0 (nominal)
 - (2) Crest of ogee weir - 737.2.
 - (3) Streambed at center line of dam - 707±.
 - (4) Maximum tailwater - unknown.
- d. Reservoir. Length of maximum pool - 5,500 feet ±.
- e. Storage (Acre-feet) - Top of dam (low point) - 1410.
- f. Reservoir Surface (Acres).
- (1) Top of dam (low point) - 117.
 - (2) Ogee weir crest - 107.
- g. Dam.
- (1) Type - earth embankment.
 - (2) Length - 650 feet ±.
 - (3) Height - 35 feet ±.
 - (4) Top width - 21 to 26 feet (measured).
 - (5) Side Slopes.
 - (a) Downstream - 3H on 1V (measured).
 - (b) Upstream - Exposed section - 4H on 1V (measured).
 - (6) Zoning - unknown.
 - (7) Impervious core - unknown.
 - (8) Cutoff - unknown.
 - (9) Grout curtain - unknown.
 - (10) Wave protection - riprap up to about 2 feet below crest elevation.

- h. Diversion and Regulation. There is a diversion structure for the City of Fayette water supply, 10 inch line.
- i. Spillway.
 - (1) Principal - none.
 - (2) Emergency.
 - (a) Type - ogee weir.
 - (b) Control section - 45° upstream face with nappe-fitting profile, 75 feet crest length, upstream height approximately 0.5 foot, vertical abutments.
 - (c) Crest elevation - 737.2 feet M.S.L.
 - (d) Upstream channel - mud and rocks with several small trees and reeds growing within 20 feet upstream of crest.
 - (e) Downstream channel - Concrete floor and sidewalls. Floor 4.5 feet lower than crest at ogee weir toe.
- j. Regulating Outlets - none.

SECTION 2 - ENGINEERING DATA

2.1 DESIGN

No design data were available for this dam.

2.2 CONSTRUCTION

No construction data were available for this dam. It was reported that it was constructed in 1918 and raised 12 feet in 1961.

2.3 OPERATION

The spillway is uncontrolled. A 10 inch water line is used as needed to withdraw municipal water for Fayette, Missouri.

2.4 EVALUATION

- a. Availability. There are no engineering data available for this dam.
- b. Adequacy. Seepage and stability analyses comparable to the requirements of the 'Recommended Guidelines for Safety Inspection of Dams' were not available, which is considered a deficiency. These seepage and stability analyses should be performed for appropriate loading conditions (including earthquake loads) and made a matter of record.
- c. Validity. Not applicable.

SECTION 3 - VISUAL INSPECTION

3.1 FINDINGS

- a. General. A visual inspection of the Fayette New City Lake Dam was made on September 20, 1978. Engineers from the firm of Hoskins-Western-Sonderegger, Inc. making the inspection were: Stephen Nickel, Geology and Soil Mechanics; Gordon Jamison, Hydrology and Hydraulics; Garold Ulmer, Civil Engineer; and Richard Walker, Hydrology. Additional information concerning the dam and its operation was obtained from H.D. Rugg, City Water Plant Superintendent. Specific observations are discussed below.
- b. Dam. The upstream slope from the water line to a point 1' ⁺ below the crest was found to be covered with a light riprap of semi-durable limestone. The riprap appears to be hand-placed and is less than 1 foot thick. Erosion to a depth of 15 to 18 inches had penetrated the riprap immediately above the permanent pool elevation at several locations in the vicinity of the water supply outlet works (see Photo No. 5). Weeds and grass were growing through the riprap for the entire length of the dam. A few small bushes were also growing through the riprap.

The downstream slope of the dam was covered by weeds and grasses, with many bushes and small trees. The density of the growth on the lower half of the downstream slope made it difficult to determine the condition of this section of embankment. No slides were noted on the downstream slope. However, seepage was observed near the right side of the spillway, near the left abutment. The seepage appeared to be emanating from two separate areas, one near the downstream toe of the embankment between 30 and 100 feet from the right spillway wall and one on the downstream face of the dam approximately between elevations 732 and 737, covering a width of approximately 3 feet at a distance of about 10 feet from the wall. The flow from the lower seep was estimated to be less than 1 gallon per minute. The flow from the upper seep was negligible, but the embankment surface was wet and the soil was saturated. The seepage water in both seeps was clear.

Near the right abutment there is a diked pond approximately 50 feet downstream from the toe of the embankment. The pond is retained by a road embankment and has a 6-inch pipe riser to maintain a pool level. At the time of the inspection the water level was below the top of the riser, consequently no flow could be measured. This water may be from seepage in the old stream channel. Between this pond and the toe of the embankment was an unexplained hole, approximately 8 feet by 5 feet and up to 2 feet deep. The bottom of the hole was above the level of the pond, and there was no water in the hole.

The abutments apparently consist of plastic silty clay, similar to that in the embankment. The presence of limestone blocks in the embankment would indicate that limestone ledges are probably present beneath the mantle of silty clay, although no outcrops were observed. Neither slides nor seepage were noticed in the abutments.

c. Appurtenant Structures.

- (1) Spillway. The spillway consists of an ogee weir with a concrete outfall or exit channel, built at the left abutment. Spillway details are shown in Appendix C. The inlet to the spillway is riprapped and was found to be nearly blocked with trees and bushes. No erosion of the inlet was observed. The concrete in the ogee section is deteriorating, and the weir had several horizontal cracks from which water was seeping. A wire fence along the top of the weir could affect the operation of the spillway. The seepage water coming out of the ogee weir flowed along the concrete floor of the channel and disappeared into a joint about 25 feet downstream from the weir (see Photo No. 12).
- (2) Water supply inlet. The water supply inlet riser stands in the reservoir near the right abutment. A 10-inch water supply line is said to lead away from the riser. It is not known whether this water line can be used as an emergency drawdown works. No details of the water supply inlet are known. It is not known whether any valves exist on the 10-inch water supply line. No information is available concerning the water supply outlet works. No other outlet works were found.

d. Reservoir Area. No wave wash, excessive erosion, or slides were observed along the shore of the reservoir.

e. Downstream Channel. The bottom of the outfall or exit channel below the ogee weir is paved with concrete. Vertical concrete walls and limestone masonry walls form the sides of the channel where it descends through the embankment. Beyond approximately the toe of the embankment, the sides of the channel are formed of broomed concrete. This appears to be a repair of erosion damage. At the end of the concrete channel bottom, the channel narrows considerably and is pretty well overgrown with weeds, bushes, and trees. Channel erosion is not significant. Approximately 1000 feet downstream the channel flows into Rogers Lake.

f. Downstream Hazards. No residences are located immediately downstream from the dam. However, any significant discharge could affect the operation and stability of Rogers Lake Dam.

3.2 EVALUATION

The heavy vegetation on the downstream slope, especially the lower half, made it impossible to fully observe the structural conditions on the slope. The small trees now growing on the downstream slope, if allowed to continue to grow, would have the potential of causing failure of the dam. The erosion in the upstream slope is a cause for alarm. If this erosion is left unchecked, it could lead to potential failure due to wave action. Additional riprap is needed all along the upstream face to prevent similar erosion in other areas. The trees in the inlet to the spillway and the fence along the top of the ogee section should be removed to allow the spillway to function as intended. The condition of the ogee section of the spillway indicates the need for remedial action to prevent its eventual failure. The joints in the upper portion of the concrete exit channel bottom should be sealed to prevent the infiltration of water. This will also reduce the possibility of failure of the channel bottom during spillway operation. The cause and correction of the seepage to the right of the spillway should be investigated. This seepage, if left uncontrolled, could lead to potential failure of the embankment and/or the spillway structure.

The source of water in the pond downstream from the toe of the dam and the affects of this impoundment on structural stability of the dam should be investigated. The cause and repair of the hole between the pond and the downstream toe of the dam should be investigated.

SECTION 4 - OPERATIONAL PROCEDURES

4.1 PROCEDURES

There are no controlled outlet works for this dam, except the 10-inch water supply line, and no regulating procedures exist.

4.2 MAINTENANCE OF DAM

The amount of brush and number of trees on the upstream slope and in the entrance section of the spillway indicate that it has been several years since vegetative control measures have been performed.

4.3 MAINTENANCE OF OPERATING FACILITIES

The only operating facility at this dam is the water supply system which is operated as a part of the total system which includes this reservoir, Rogers Lake and Fayette Old City Reservoir.

4.4 DESCRIPTION OF WARNING SYSTEM IN EFFECT

The inspection team is not aware of any warning system in effect at this dam.

4.5 EVALUATION

Brush and trees growing on the upstream slope, trees and brush growing in the entrance section of the spillway and deterioration of concrete in the spillway could lead to potential of failure if left uncontrolled.

SECTION 5 - HYDRAULIC/HYDROLOGIC

5.1 EVALUATION OF FEATURES

- a. Design Data. No design data were found for this dam. According to city employees the dam was raised approximately 12 feet about 1961. One page of cross section plans were found indicating the intended change.
- b. Experience Data. The drainage area, reservoir surface area, and elevation-storage data were developed from the USGS Fayette, Missouri and Glasgow, Missouri 7 1/2 minute topographic quadrangle maps. The hydraulic computations for the spillway and dam overtopping discharge ratings were based on data collected in the field at the time of the field inspection.
- c. Visual Observations.
 - (1) The ogee weir appears to be in poor condition with horizontal cracks and deteriorating concrete. The spillway exit channel appears to be in good condition, except for open expansion joints. The trees and weeds in the approach channel probably would reduce the efficiency of the weir.
 - (2) The woven-wire fence attached to the 2-inch iron-pipe posts imbedded vertically into the top of the weir crest could act as a trash collector in a major flood. The resulting stresses could possibly break the weir crest and would destroy the fence.
 - (3) The discharges from this lake are impounded in Rogers Lake located about 1000 feet downstream from Fayette New City Lake. It appears that maximum water levels in Rogers Lake would nearly impinge upon the toe of this structure.
- d. Overtopping Potential. The spillway will pass both the 100-year flood and 50% of the PMF without overtopping. The PMF will overtop the dam a maximum of 1.9 feet and for a period of 4.0 hours. The spillway will just pass 50% of the PMF before overtopping the dam. The results of the routing through the reservoir are tabulated in regards to the following conditions.

<u>Frequency</u>	<u>Peak Inflow Discharge c.f.s.</u>	<u>Peak Outflow Discharge c.f.s.</u>	<u>Maximum Pool Elevation</u>	<u>Freeboard Top of Dam Min. Elev. 741.2</u>	<u>Time Dam Overtopping Hrs.</u>
100-Year	1550	720	739.1	+2.1	-
1/2 PMF	3740	2050	741.2	0	-
PMF	7560	6410	743.1	-1.9	5.0
0.50 PMF	3740	2050	741.2	0	-

According to the recommended guidelines from the Department of the Army, Office of the Chief of Engineers, this dam is classified as having a high hazard rating and an intermediate size. Therefore, the PMF is the test for the adequacy of the dam and its spillways.

The St. Louis District, Corps of Engineers, in a letter dated 11 August, 1978 has estimated the damage zone as extending five miles downstream from the dam. Immediately downstream of the dam is Rogers Lake Dam (Mo. 10370). Failure of Fayette New City Lake Dam could cause failure of Rogers Lake Dam. Within the downstream damage zone of Rogers Lake Dam are fifteen houses, three improved road bridges, one state highway bridge and one railroad bridge.

SECTION 6 - STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

- a. Visual Observations. Visual observations which adversely affect the structural stability of this dam are discussed in Section 3. These include the following features: small trees and rank vegetation on both slopes, trees in the spillway inlet channel, seepage from the embankment near the spillway, ponded water of unknown source near the embankment toe at the right abutment, cracks and deteriorating concrete in the ogee weir of the spillway, the fence along the weir, open joints in the concrete on the bottom of the exit channel, and erosion of the upstream face which has penetrated the riprap in several locations near the right abutment.
- b. Design and Construction Data. No design or construction data were available.
- c. Operating Records. Other than the water supply inlet, there are no operating structures at this dam.
- d. Post Construction Changes. Increasing the crest elevation approximately 12 feet in 1961 and increasing the pool elevation probably could affect the structural stability of the dam. Additional investigation and analysis would be required to evaluate these affects.
- e. Seismic Stability. This dam is in Seismic Zone 1. An earthquake of the magnitude used for design in this seismic zone is not expected to cause structural failure of this dam.

SECTION 7 - ASSESSMENT/REMEDIAL MEASURES

7.1 DAM ASSESSMENT

- a. Safety. Several items were noted during the visual inspection which could seriously threaten the safety of the dam if not corrected or controlled. These items include uncontrolled vegetation on both slopes of the dam, erosion through the riprap at several locations in the upstream slope, seepage from the embankment near the spillway, possible seepage below the dam near the right abutment, uncontrolled trees in the spillway inlet channel, cracks and deteriorating concrete in the ogee weir of the spillway, the fence along the weir, and open joints in the concrete on the bottom of the exit channel. The Probable Maximum Flood will overtop the dam. The spillway will just pass 50% of the PMF before overtopping the dam.

Overtopping of this dam will affect Rogers Lake Dam just downstream from the Fayette New City Lake Dam (See Plate A-1 and Photo No. 16).

- b. Adequacy of Information. Since no engineering or construction data were available, the conclusions of this report are based upon performance history and visual observations. The inspection team considers that these data are sufficient to support the conclusions herein. Neither a seepage nor a stability analysis were found. This is a deficiency which should be corrected in the near future.
- c. Urgency. The remedial measures recommended in paragraph 7.2 should be accomplished in the near future.
- d. Necessity for Phase II. A Phase II investigation is not called for. However, additional engineering data and analyses should be obtained by the owner, at the owner's expense, to evaluate and design the recommended remedial measures.
- e. Seismic Stability. This dam is in Seismic Zone 1. An earthquake of the magnitude used for design in this seismic zone is not expected to cause structural failure of this dam.

7.2 REMEDIAL MEASURES

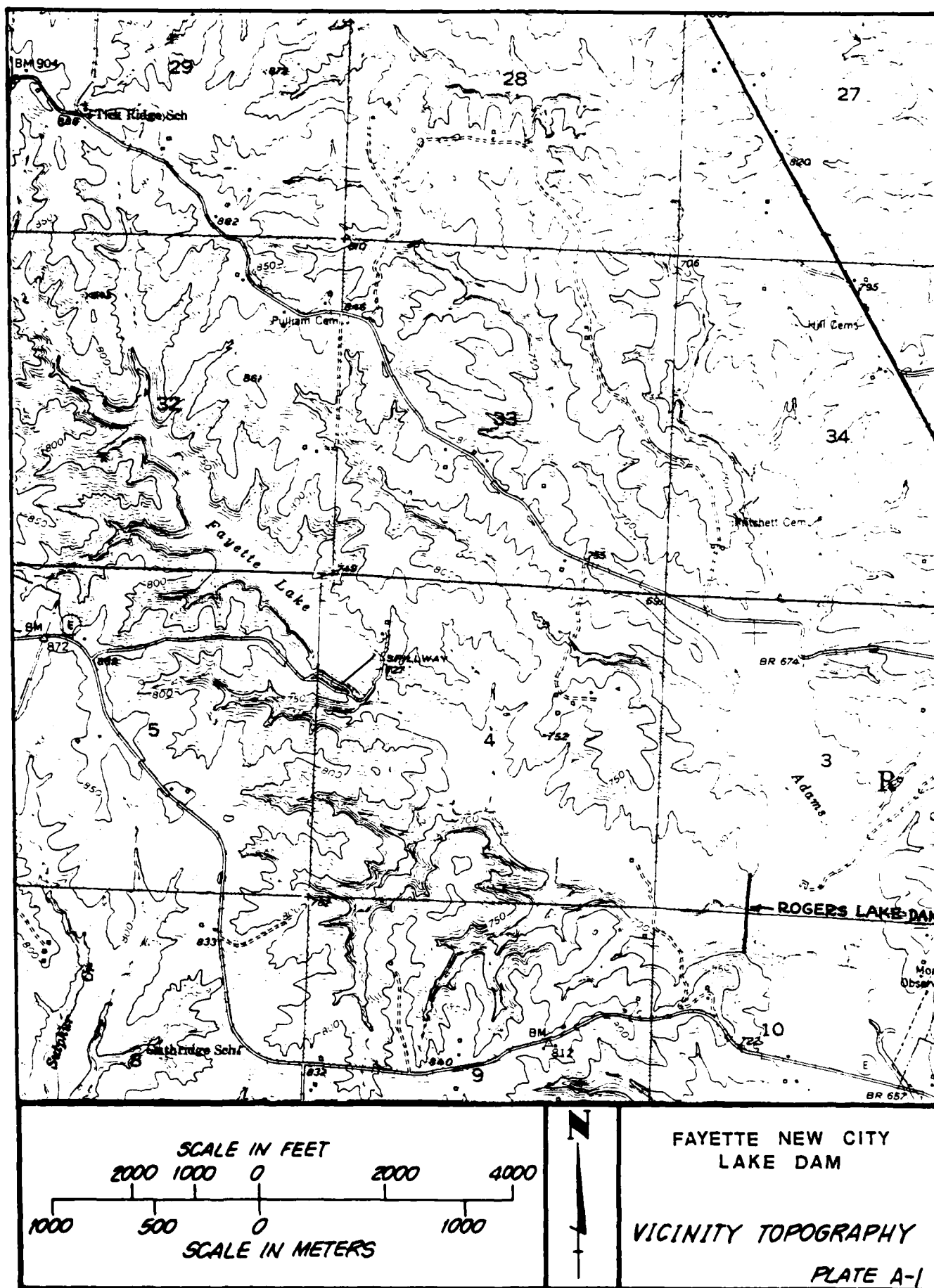
- a. Alternatives. The size of the spillway and/or the height of the dam should be increased and/or the permanent pool elevation should be lowered so that the Probable Maximum Flood can be passed without overtopping the dam. Regardless of which of these alternatives are chosen, additional investigations and analyses should be conducted to determine the structural

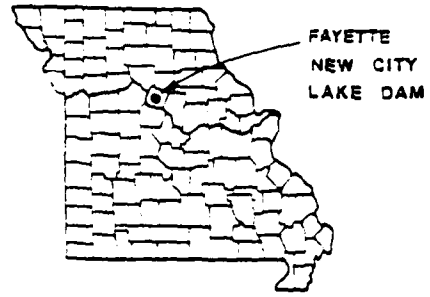
characteristics and stability of the present embankment. These analyses should include a seepage analysis to determine the source of seepage near the spillway and to determine whether there is any seepage near the right abutment below the dam. The cause and corrective action for the leaking joints in the exit channel should be studied. The services of an engineer experienced in the design of dams should be obtained to perform the investigations and analyses of the present dam and to design the appropriate modifications and remedial measures.

b. O & M Maintenance and Procedures. The following O & M maintenance and procedures are recommended:

- (1) A program should be developed and put into action to keep trees and brush off the dam and out of the spillway inlet and to control other vegetation.
- (2) The erosion damage to the upstream slope should be repaired. Additional riprap, sized for this reservoir, should be placed on top of the existing riprap on the upstream slope to prevent further erosion of the slope and to eliminate the potential for breaching of the dam by erosion.
- (3) The ogee weir should be repaired if it is to remain in place. The fence along the top of the ogee weir should be removed.
- (4) The dam should be inspected regularly by qualified personnel to determine the presence of seepage on the downstream slope, in the abutments, or below the downstream toe, to determine the presence of slides in the downstream slope, and to observe the upstream slope for erosional damage.

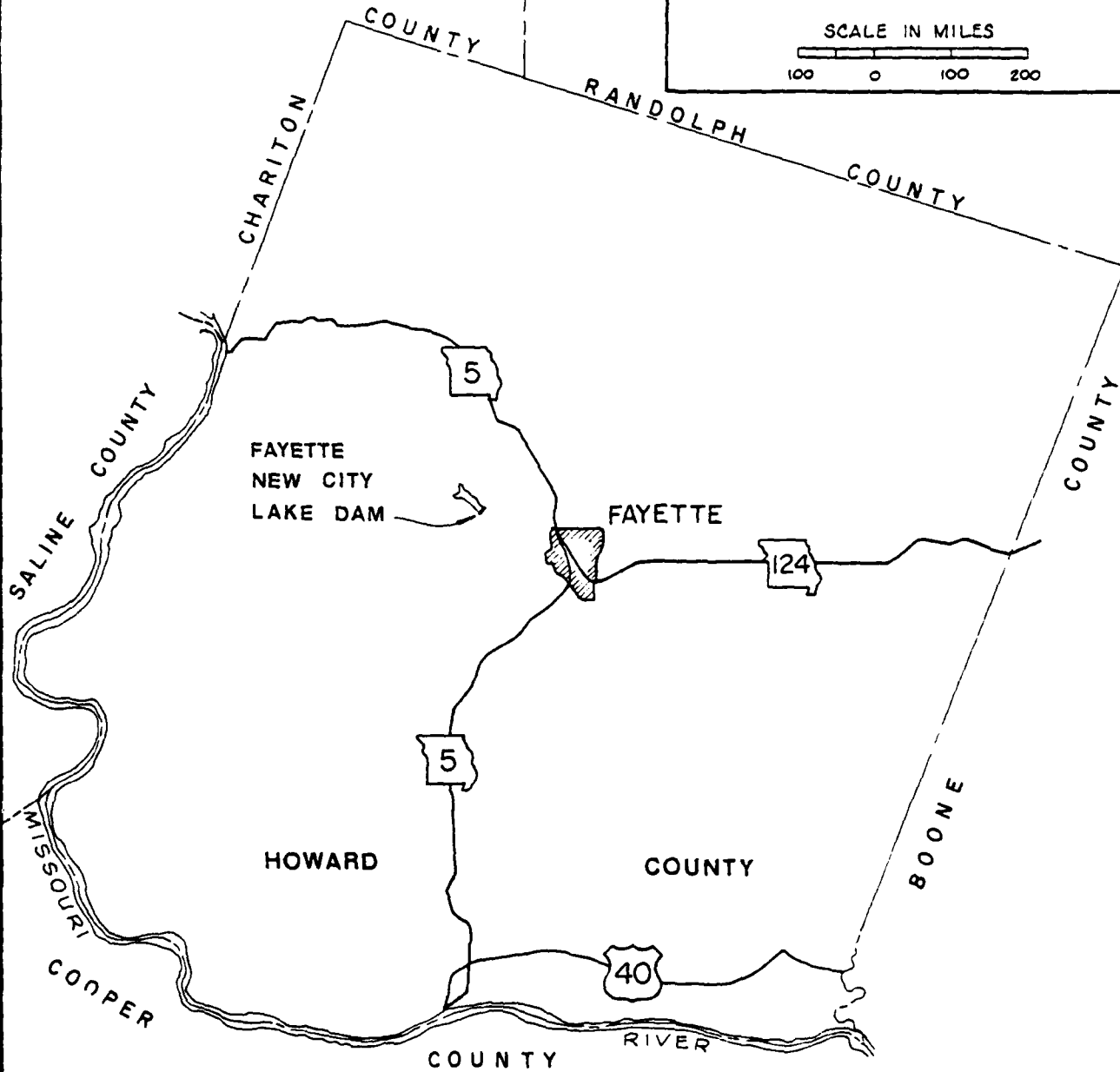
APPENDIX A
MAPS



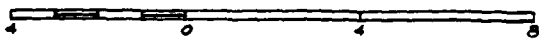


VICINITY MAP

SCALE IN MILES
100 0 100 200



SCALE IN MILES



LOCATION MAP
PLATE A-2

APPENDIX B
PHOTOGRAPHS



PHOTO NO. 2
UPSTREAM SLOPE TAKEN
FROM EMERGENCY SPILLWAY



PHOTO NO. 3
INLET STRUCTURE
TAKEN FROM STA. 5+00



PHOTO NO. 4
INLET STRUCTURE AND
UPSTREAM SLOPE TAKEN
FROM RIGHT ABUTMENT

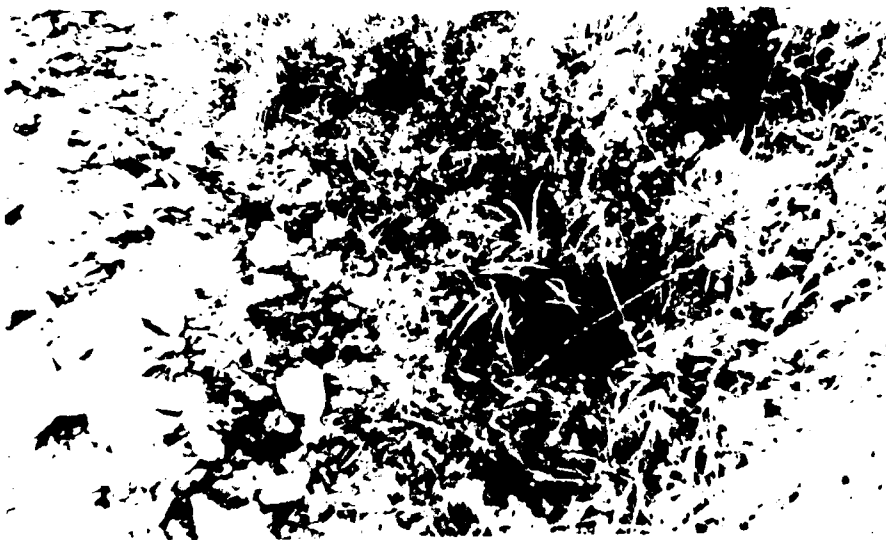


PHOTO NO. 5
CLOSE-UP OF UPSTREAM
SLOPE EROSION. STA. 4+70
TO STA. 6+00



PHOTO NO. 6
RIGHT ABUTMENT
TAKEN FROM STA. 4+70



PHOTO NO. 7
DIKED POOL BELOW
RIGHT ABUTMENT



PHOTO NO. 8
DOWNSTREAM SLOPE
TAKEN FROM RIGHT
ABUTMENT. NOTE
VEGETATIVE CHANGE
ONE-HALF WAY UP



PHOTO NO. 9
DEPRESSION NEAR
TOE. STA. 4+50

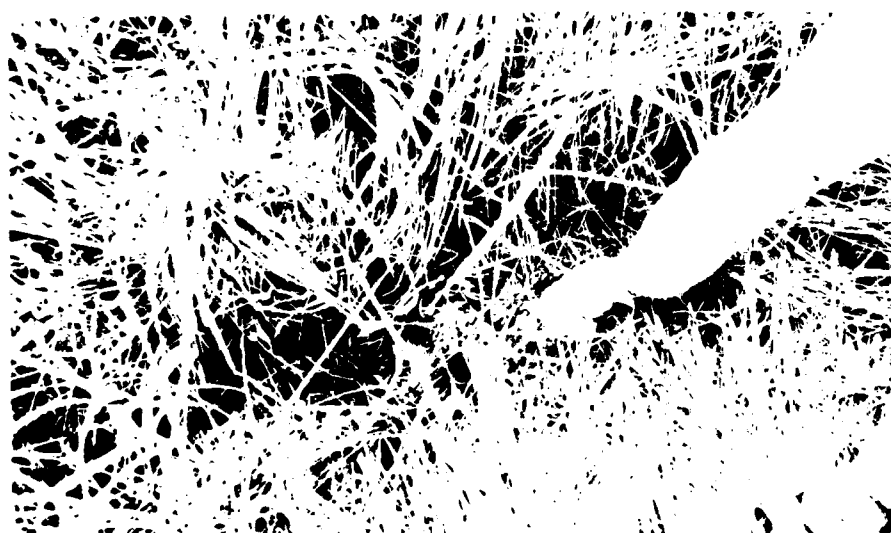


PHOTO NO. 10
FREE WATER NEAR
TOE. STA. 0+50



PHOTO NO. 11
UPSTREAM VIEW OF
OGEE SPILLWAY



PHOTO NO. 12
WATER LEAKING FROM
CRACK IN WEIR



PHOTO NO. 13
DOWNSTREAM FROM
OGEE SPILLWAY



PHOTO NO. 14
EXIT CHANNEL
FOR EMERGENCY
SPILLWAY

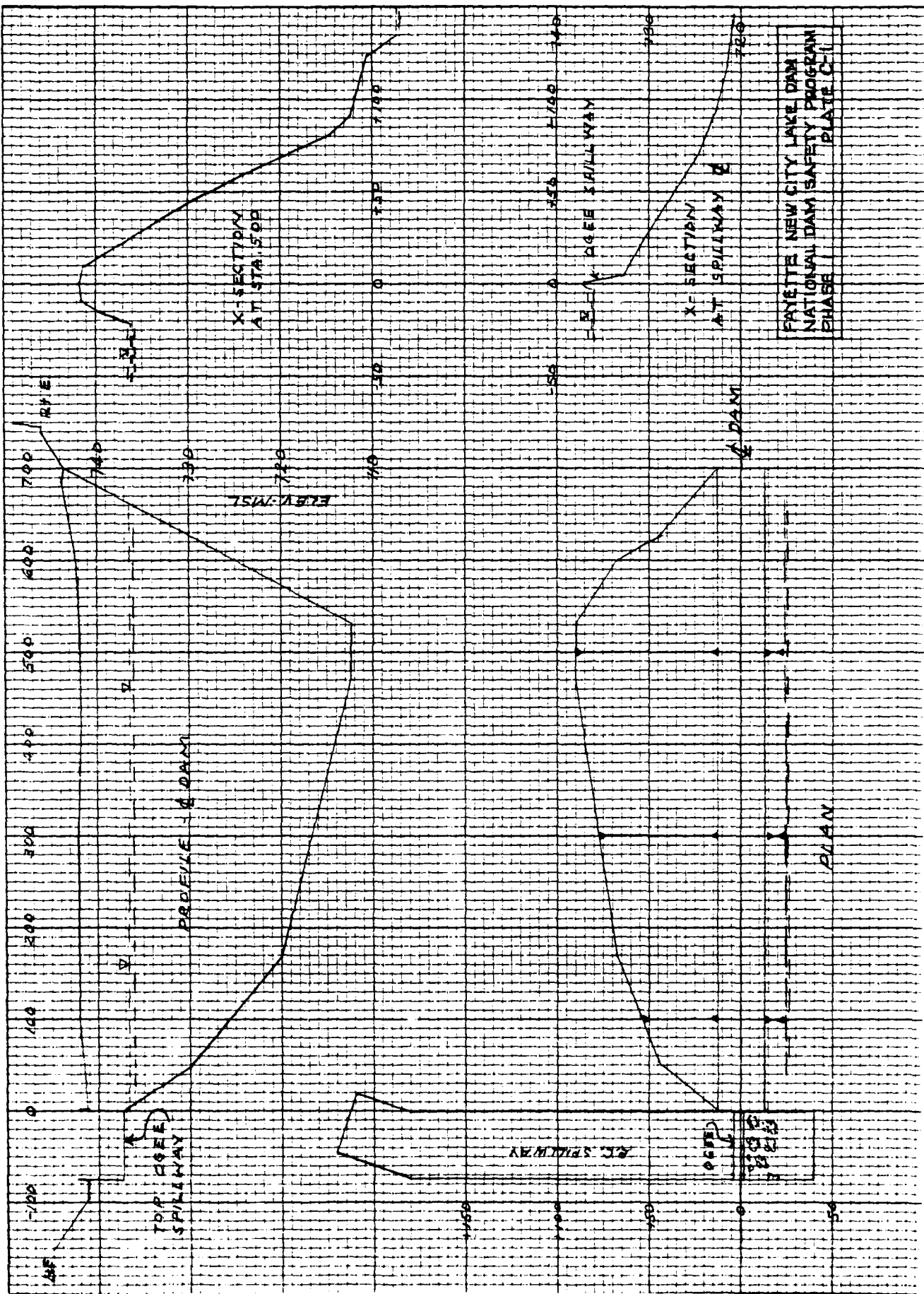


PHOTO NO. 15
LEFT ABUTMENT
TAKEN FROM STA. 4+70



PHOTO NO. 16
DOWNSTREAM FROM
DAM. TAKEN FROM
STA. 4+70

APPENDIX C
PLAN, PROFILE AND SECTIONS



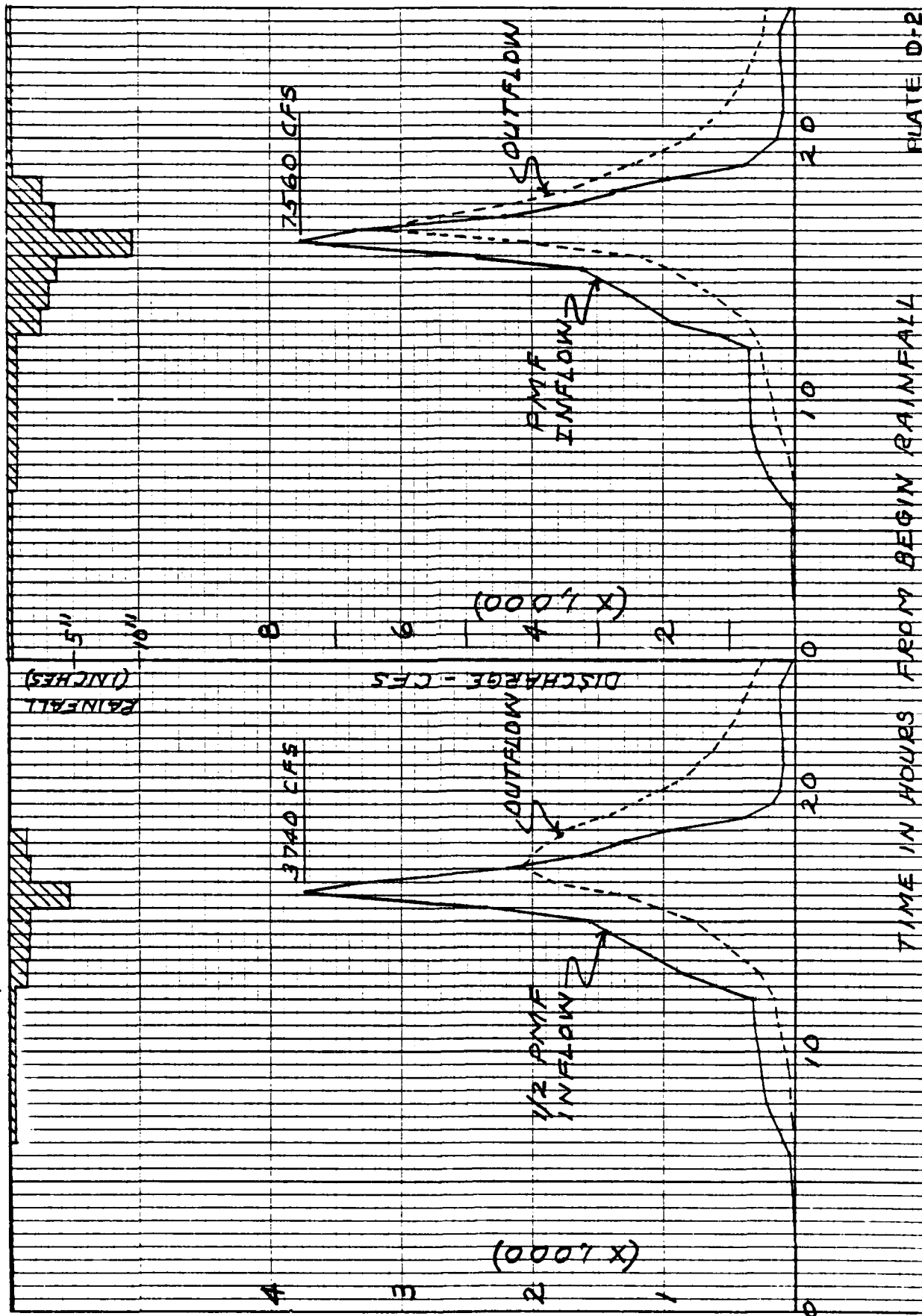
FAYETTE NEW CITY LAKE DAM
NATIONAL DAM SAFETY PROGRAM
PHASE I
PLATE C-1

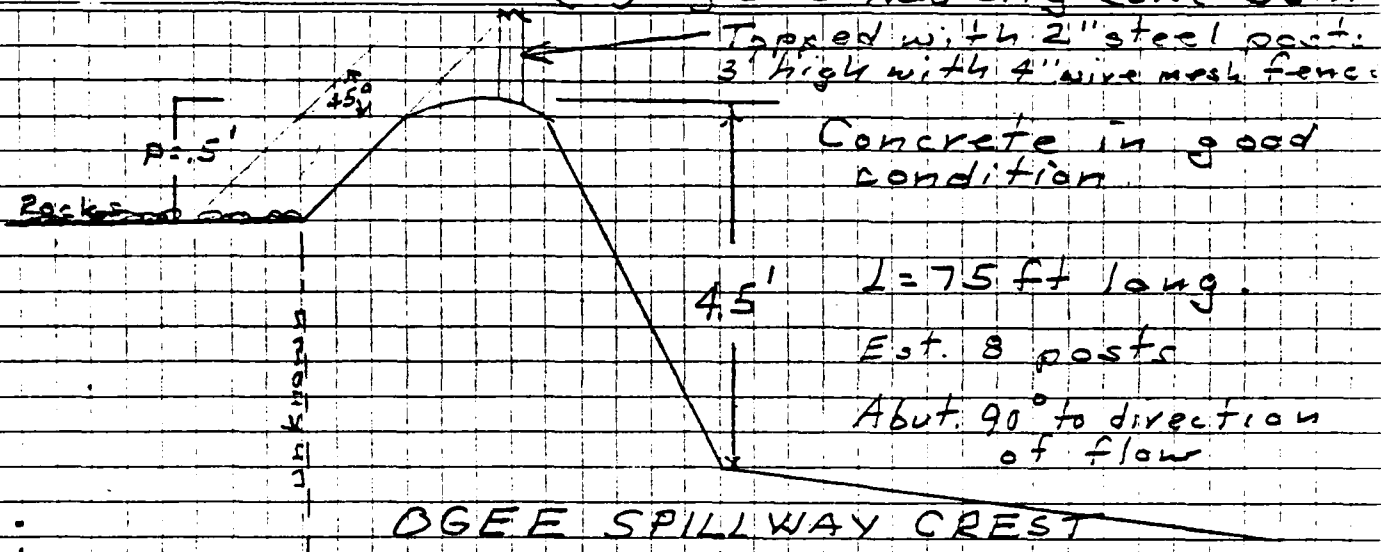
APPENDIX D
HYDROLOGIC COMPUTATIONS

HYDROLOGIC COMPUTATIONS

1. The Mockes dimensionless standard curvilinear unit hydrograph and the SCS TR-20 program were used to develop the inflow hydrographs (see Plate D1). The inflow hydrograph for the 100-year flood was generated by the consultant using the TR-20 program.
 - a. Six-hour, twelve-hour, and twenty-four hour 100-year rainfall for the dam location was taken from NOAA Technical Paper 40. The 24-hour probable maximum precipitation was taken from the curves of Hydrometeorological Report No. 33 and current Corps of Engineers and St. Louis District policy and guidance for hydraulics and hydrology.
 - b. Drainage area = 1.40 square miles (895 acres).
 - c. Time of concentration of runoff = 58 minutes (computed from "Kirpich" formula.)^{1/}
 - c. Time of concentration of runoff = 58 minutes.
 - d. The antecedent storm conditions were heavy rainfall and low temperatures which occurred on the previous 5 days (SCS AMCIII). The initial pool elevation was assumed at the crest of the spillway.
 - e. The total 24-hour storm duration losses for the 100-year storm were 1.21 inches. The total losses for the 24-hour duration 1/2 PMF storm were 1.30 inches. The total losses for the PMF storm were 1.35 inches. These data are based on SCS runoff curve No. 90 and antecedent moisture conditions from SCS AMCIII.
 - f. Average soil loss rates = 0.05 inch per hour approximately.
2. The ogee weir discharge rating was developed using the standard formula $Q = CLH^{3/2}$ and coefficients derived from diagrams found in the Bureau of Reclamation publication, "Design of Small Dams". The flows over the dam crest were based on the broad-crested weir equation $Q = CLH^{3/2}$, where H is the head on the dam crest; the coefficient C, which varies with head, was taken from the USGS publication "TWRI, Book 3, Chapter 5, Measurement of Peak Discharge at Dams by Indirect Methods".
3. Floods were routed through the reservoir using the TR-20 program to determine the capabilities of the spillway and dam embankment crest. The storm rainfall patterns, inflow hydrographs and routed outflow hydrographs are shown on Plate D2.
 - 1/ The computation interval for the runoff hydrograph is automatically adjusted to $0.17 T_c$ by the TR-20 computer program.

FAYETTE NEW CITY LAKE DAM - # 10130



(#2) Fayette New City Lake Dam
Mo. No 10130

From USB R "Design of Small Dams" - Spillway Sect.

General Equation = $Q = CLH_u^{3/2}$ pg 271

To adj. for effect of steel posts and fence on top of dam and abutment effect the length of crest is adjusted by the following formula

$$L = L' - 2(NK_p + K_a)H_e \quad \text{pg. 271 (assume posts as piers)}$$

$K_p = .02$ (round posts + fence)

$$L = 75 - 2(8 \times .02 + .20)H_e$$

$$= 75 - 2(.16 + .20)H_e$$

$$= 75 - .72H_e$$

C = From Figs. 189 & 191 pgs. 276, 277.

HOSKINS-WESTERN SONDEREGGER, INC.
ENGINEERS ARCHITECTS PLANNERS
LINCOLN, NEBRASKA

TABULATION SHEET

COMPUTED BY GGJ DATE 10/6/97 SHEET NO. 2 OF 2
CHECKED BY _____ DATE _____ JOB NUMBER 78/3095
PROJECT MO DAM INSP.

CALCULATIONS FOR

OGEE SPILLWAY Rtg.

Fayette New City Lake (#2) 10130

		H	L	C				
			(75-72H)	$\frac{P}{H}$	C_v	C_{45°	$C_{45^\circ} L$	$H^{3/2}$
	Elev. 737.2	1.0	2	3	4	5	6	7.0
1	737.3	.1	74.9	.5395	3.93			9
	737.4	.2	74.9	.25394	3.92			26
	737.6	.4	74.7	.125391	3.89			74
	737.8	.6	74.6	.093387	3.88			135
5	738.2	1.0	74.3	.15390	3.85			286
	738.7	1.5	73.9	.33371	3.79			515
	739.2	2.0	73.6	.25362	3.73			776
	739.7	2.5	73.2	.2356	3.68			1065
	740.2	3.0	72.8	.17350	3.64			1377
10	740.7	3.5	72.5	.14346	3.61			1714
Lowest dam Crest	741.2	4.0	72.1	.125345	3.61			2082
	741.7	4.5	71.8	.11340	3.57			2447
	742.2	5.0	71.4	.1340	3.57			2850
	742.5	5.3	71.2	.1340	3.57			3101
15	743.0	5.8	70.8	.1340	3.57			3530
	743.5	6.3	70.4	.1340	3.57			3974
	741.4	4.2	72.0	.12340	3.57			2212
	742.0	4.8	71.5	.1340	3.57			2694
20								
25								
30								

HOSKINS-WESTERN-SONDEREGGER

COMPUTED BY GGJ DATE 10/9/78 SHEET NO. 73 OF 95CHECKED BY _____ DATE _____ JOB NUMBER 73/3025

CALCULATIONS FOR

PROJECT _____

Combined Rating

	<u>Elev.</u>	<u>D&EE</u>	<u>EMBANK.</u>	<u>TOTAL</u>
D&EE Crest	737.2	0		0
	737.3	9	-	9
	737.4	26	-	26
	737.6	74	-	74
	737.8	135	-	135
	738.2	286	-	286
	738.7	515	-	515
	739.2	776	-	776
	739.7	1065	-	1065
	740.2	1377	-	1377
	740.7	1714	-	1714
	741.2	2082	0	2082
	741.4	2212	3	2215
	741.7	2447	30	2477
	742.0	2684	150	2834
	742.2	2850	386	3236
	742.5	3101	954	4055
	743.0	3530	2371	5900
	743.5	3974	4087	8061

HYDROLOGY PROGRAM FOR ID# 1130 - DATED JULY, 1968
 MO DAM INSP FAYETTE NEW CITY LAKE DAM
 EXECUTIVE CONTROL CARD
 MO DAM INSP FAYETTE NEW CITY LAKE DAM
 OPERATION LIST

TR-20 CONTINUED

C TABLE VELOCITY INCREMENT = 0.200

0	0.0000	0.0400	0.1400	0.2500	0.3200
0	0.3700	0.4100	0.4500	0.4900	0.5100
0	0.5400	0.5700	0.5900	0.6100	0.6300
0	0.6500	0.6800	0.7000	0.7200	0.7400
0	0.7600	0.7900	0.8100	0.8300	0.8500
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0	1.0800	1.1000	1.1200	1.1400	1.1600
0	1.1800	1.2000	1.2200	1.2400	1.2600
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0	1.3800	1.4000	1.4200	1.4400	1.4600
0	1.4800	1.5000	1.5200	1.5400	1.5600
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0	1.6800	1.7000	1.7200	1.7400	1.7600
0	1.7800	1.8000	1.8200	1.8400	1.8600
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0	17.2800	17.3000	17.3200	17.3400	17.3600
0	17.3800	17.4000	17.4200	17.4400	17.4600
0	17.4800	17.5000	17.5200	17.5400	17.5600
0	17.5800	17.6000	17.6200	17.6400	17.6600
0	17.6800	17.7000	17.7200	17.7400	17.7600
0	17.7800	17.8000	17.8200	17.8400	17.8600
0	17.8800	17.9000	17.9200	17.9400	17.9600
0	17.9800	18.0000	18.0200	18.0400	18.0600
0	18.0800	18.1000	18.1200	18.1400	18.1600
0	18.1800	18.			

STANDARD CONTROL INSTRUCTIONS

SUBRTN	XSECTN	STRTI	HYDROGRAPHIS	DATA NO. 1	DATA NO. 2	DATA NO. 3	PR	OUT	OPTICS
RUIOFF	0	1	IN1	0	78,000	0.970	1	1	1
RESVOR	0	1	IN2	0	0,000	0.000	1	1	1
ENDATA			OUT	7,37,200					

END OF LISTING

STRUCTURE NO. 1

PNF

```

SUBROUTINE RUNOFF
  AREA= 1.40
  STRUCTURE 1
  INPUT RUNOFF CURVE= 76.0
  TIME OF CONCENTRATION= 0.97

```

[illegible]

SURROUNDING	RESVOR SURFACE ELEVATION=	STRUCTURE 1	73.20	PEAK DISCHARGES	PEAK ELEVATION,
				6406.844	743.11
				16.50	

[illegible]

17.00	FLEV	742.91	742.72	742.55	742.41	742.29	742.17	742.00	741.85	741.64	741.55
19.50	MISCNG	1999.84	1800.39	1608.61	1429.58	1305.71	1200.95	1120.25	1037.16	957.65	885.67
19.50	FLEV	741.08	740.81	740.54	740.27	740.08	739.93	739.78	739.65	739.51	739.38
22.00	MISCNG	820.51	762.97	714.32	670.01	629.72	593.27	560.32	530.58	508.32	481.72
22.00	FLEV	739.27	739.17	739.08	738.99	738.91	738.84	738.78	738.72	738.67	738.62
24.50	MISCNG	457.48	431.76	404.56	376.60	349.53	323.91	299.70	274.63	247.83	223.72
24.50	ELEV	738.57	738.51	738.45	738.39	738.33	738.28	738.23	738.16	738.09	738.05

TOTAL WATER, IN INCHES ON DRAINAGE AREA = 29.4667 CFS-HRS = 26623.70 ACRE-FT = 2200.16

ETDCMP 1

EXECUTIVE CONTROL CARD
STARTING TIME = 1
ALTERNATE NO. = 1
OPERATION CONTROL
RAIN DPTH = 0.50
RAIN DURATION = 4
FROM XSFCIN/STRUCT
NO. = 3
TO ASECIN/STRUCT
NO. = 3
SOIL CONDITION = 3

```

SUBROUTINE RUNOFF
  ADRA=1.40
  STRUCTURE 1
  INPUT 1
  COMPUTED CURVE NO. = 89.0
  HUNOFF CURVE= 78.0
  TML OF CONCENTRATION= 0.97

```

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS (NO. OFF)
16.17	3744.525	(NO. OFF)
23.66	106.135	(NO. OFF)

[illegible]

16.03
TOTAL WATER, IN INCHES ON DRAINAGE AREA = 14.7677
CFS-IIS= 15350.89
ACRE-FT= 1101.91

SURROUNDING	REL. VOR	STRUCTURE	1
	SURFACE	ELEVATION	737.20
1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20
21	22	23	24
25	26	27	28
29	30	31	32
33	34	35	36
37	38	39	40
41	42	43	44
45	46	47	48
49	50	51	52
53	54	55	56
57	58	59	60
61	62	63	64
65	66	67	68
69	70	71	72
73	74	75	76
77	78	79	80
81	82	83	84
85	86	87	88
89	90	91	92
93	94	95	96
97	98	99	100

 $\frac{1}{2} \text{ PMF}$

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS	TOTAL
17.11	2052.640	751.16	751.16

TIME	HYDROGRAPH		TZERO= 3.75		DEPTA T= 0.25		DRAGHOLE		AREA= 1.40	
	0.00	0.05	0.06	0.11	0.16	0.21	0.37	0.49	0.51	0.51
	737.20	737.20	737.20	737.20	737.20	737.20	737.20	737.20	737.20	737.20
01SCNG ELEV	0.70	1.11	2.63	3.05	3.30	3.93	0.75	15.25	11.20	0.01
01SCNG ELEV	737.20	737.21	737.22	737.24	737.25	737.27	737.29	737.33	737.35	737.35
01SCNG ELEV	23.38	33.71	62.41	75.32	83.00	92.16	100.40	108.73	116.25	116.25
01SCNG ELEV	737.20	737.21	737.22	737.24	737.25	737.27	737.29	737.33	737.35	737.35
01SCNG ELEV	124.33	131.07	161.01	179.92	206.51	247.76	290.53	340.27	390.21	450.04
01SCNG ELEV	737.20	737.21	737.22	737.24	737.25	737.27	737.29	737.33	737.35	737.35
01SCNG ELEV	453.53	509.99	640.45	709.47	789.20	869.27	949.51	1029.71	1109.91	1189.15
01SCNG ELEV	737.20	737.21	737.22	737.24	737.25	737.27	737.29	737.33	737.35	737.35
01SCNG ELEV	1622.59	1856.98	2047.61	2046.36	2013.89	1921.70	1893.46	1827.51	1759.44	1759.44
01SCNG ELEV	740.56	740.69	741.15	741.15	741.10	741.03	740.95	740.65	740.75	740.75
01SCNG ELEV	1619.08	1774.67	1842.56	1847.48	1857.60	1866.36	1866.76	1812.45	1747.02	1747.02
01SCNG ELEV	740.55	740.54	739.48	739.03	739.68	739.53	739.59	739.66	739.66	739.66
01SCNG ELEV	522.03	641.01	551.76	513.06	481.64	452.42	423.01	401.58	378.87	378.87
01SCNG ELEV	739.03	738.94	738.77	738.69	738.62	738.56	738.50	738.43	738.40	738.40
01SCNG ELEV	358.15	338.95	302.01	285.01	259.25	230.30	213.25	192.70	173.94	173.94
01SCNG ELEV	738.35	738.27	738.23	738.19	738.12	738.06	738.00	737.95	737.90	737.90
01SCNG ELEV	141.46	131.00	126.46	121.26	116.27	111.90	106.89	102.49	98.03	98.03
01SCNG ELEV	737.01	737.70	737.77	737.75	737.73	737.72	737.70	737.69	737.67	737.67

TOTAL WATER, IN INCHES ON DRAINAGE AREA = 13.9065

PRINCIPAL

EXECUTIVE CONTROL CARD
NO NAM INSP PAYTIF NEW CITY LARL OAM
OPERATION LIST

MO DAM INSP FAYETTE NEW CITY LAKE DAM

C TABLE

0.0000	0.0900	0.1800	0.2700	0.3200
0.3700	0.4100	0.4500	0.4200	0.5100
0.5400	0.5700	0.5900	0.6100	0.6300
0.6500	0.6600	0.6700	0.6900	0.7000
0.7100	0.7200	0.7300	0.7400	0.7500
0.7600	0.7700	0.7700	0.7800	0.7900
0.7900	0.8000	0.8100	0.8100	0.8200
0.8200	0.8300	0.8300	0.8400	0.8400
0.8500	0.8500	0.8500	0.8600	0.8600
0.8600	0.8600	0.8700	0.8700	0.8700
0.8800	0.8800	0.8800	0.8900	0.8900
0.8900	0.8900	0.8900	0.8900	0.8900
0.9000	0.9000	0.9000	0.9000	0.9100
0.9100	0.9100	0.9100	0.9100	0.9100
0.9200	0.9200	0.9200	0.9200	0.9200
0.9200	0.9200	0.9200	0.9300	0.9300

5. 7. 2013

STRUCTURE NO. 1

STORAGE.
940.0000

ELEVATION	DISCHARGE
757.2000	0.0000

9 ENUTAL
DIMENSIONLESS HYDROGRAPH - DELTA T = 484.00

[illegible]

5 FURTHER

TRAINFALL TABLE NO. 1

TIME INCREMENT = 0.50

[illegible]

7/10/13

RAINFALL TABLE NO. 2

TIME INCREMENT = 0.02

0.0000	0.0100	0.0200	0.0700	0.0300
0.0000	0.0500	0.0600	0.0700	0.0800
0.1000	0.1100	0.1300	0.1000	0.1700
0.1800	0.2200	0.2700	0.3200	0.4900
0.5000	0.6000	0.6300	0.6400	0.6800
0.7000	0.7200	0.7400	0.7000	0.7700
0.7800	0.8000	0.8200	0.8300	0.8400
0.8500	0.8700	0.8900	0.9000	0.9000
0.9100	0.9200	0.9300	0.9400	0.9500
0.967	0.9633	0.9700	0.9800	0.9800
1.0000	1.0000	1.0000	1.0000	1.0000

05 JUL 73

RAINFALL TABLE NO. 5

Net Income = 0.00

α	0.0000	0.0500	0.1000	0.1500
α	0.0000	0.0500	0.1000	0.1500

STANDARD CONTROL INSTRUCTIONS									
SURRTN	XSECTN	STNCT	HYDROGRAPHIS	DATA NO. 1	DATA NO. 2	DATA NO. 3	PK	OUTPUT	OPTIONS
RUNOFF	0	1	INH	0	78.000	0.578	1	1	V
RESVOR	0	0	INH2	0	0.000	0.000	1	1	1
ENDATA	0	0	OUT	737.200	0.000	0.000	1	1	0
									SA

END OF LISTING

ADDITIONS TO TABULAR DATA FOLLOW

STRUCTURE NO. 1

737.2000	0.0000	940.0001
737.3000	9.0000	960.0001
737.4000	26.0000	975.0001
737.5000	75.0000	990.0001
737.6000	150.0000	1020.0001
737.7000	242.0000	1050.0002
737.8000	345.0000	1110.0002
737.9000	450.0000	1170.0002
738.0000	555.0000	1230.0002
738.1000	660.0000	1290.0002
738.2000	765.0000	1350.0002
738.3000	870.0000	1410.0002
738.4000	975.0000	1470.0002
738.5000	1080.0000	1520.0002
738.6000	1185.0000	1580.0002
738.7000	1290.0000	1640.0002
738.8000	1395.0000	1700.0002
738.9000	1500.0000	1760.0002
739.0000	1605.0000	1820.0002
739.1000	1710.0000	1880.0002
739.2000	1815.0000	1940.0002
739.3000	1920.0000	2000.0002
739.4000	2025.0000	2060.0002
739.5000	2130.0000	2120.0002
739.6000	2235.0000	2180.0002
739.7000	2340.0000	2240.0002
739.8000	2445.0000	2300.0002
739.9000	2550.0000	2360.0002
740.0000	2655.0000	2420.0002
740.1000	2760.0000	2480.0002
740.2000	2865.0000	2540.0002
740.3000	2970.0000	2600.0002
740.4000	3075.0000	2660.0002
740.5000	3180.0000	2720.0002
740.6000	3285.0000	2780.0002
740.7000	3390.0000	2840.0002
740.8000	3495.0000	2900.0002
740.9000	3600.0000	2960.0002
741.0000	3705.0000	3020.0002
741.1000	3810.0000	3080.0002
741.2000	3915.0000	3140.0002
741.3000	4020.0000	3200.0002
741.4000	4125.0000	3260.0002
741.5000	4230.0000	3320.0002
741.6000	4335.0000	3380.0002
741.7000	4440.0000	3440.0002
741.8000	4545.0000	3500.0002
741.9000	4650.0000	3560.0002
742.0000	4755.0000	3620.0002
742.1000	4860.0000	3680.0002
742.2000	4965.0000	3740.0002
742.3000	5070.0000	3800.0002
742.4000	5175.0000	3860.0002
742.5000	5280.0000	3920.0002
742.6000	5385.0000	3980.0002
742.7000	5490.0000	4040.0002
742.8000	5595.0000	4100.0002
742.9000	5700.0000	4160.0002
743.0000	5805.0000	4220.0002
743.1000	5910.0000	4280.0002
743.2000	6015.0000	4340.0002
743.3000	6120.0000	4400.0002
743.4000	6225.0000	4460.0002
743.5000	6330.0000	4520.0002
743.6000	6435.0000	4580.0002
743.7000	6540.0000	4640.0002
743.8000	6645.0000	4700.0002
743.9000	6750.0000	4760.0002
744.0000	6855.0000	4820.0002
744.1000	6960.0000	4880.0002
744.2000	7065.0000	4940.0002
744.3000	7170.0000	5000.0002
744.4000	7275.0000	5060.0002
744.5000	7380.0000	5120.0002
744.6000	7485.0000	5180.0002
744.7000	7590.0000	5240.0002
744.8000	7695.0000	5300.0002
744.9000	7800.0000	5360.0002
745.0000	7905.0000	5420.0002
745.1000	8010.0000	5480.0002
745.2000	8115.0000	5540.0002
745.3000	8220.0000	5600.0002
745.4000	8325.0000	5660.0002
745.5000	8430.0000	5720.0002
745.6000	8535.0000	5780.0002
745.7000	8640.0000	5840.0002
745.8000	8745.0000	5900.0002
745.9000	8850.0000	5960.0002
746.0000	8955.0000	6020.0002
746.1000	9060.0000	6080.0002
746.2000	9165.0000	6140.0002
746.3000	9270.0000	6200.0002
746.4000	9375.0000	6260.0002
746.5000	9480.0000	6320.0002
746.6000	9585.0000	6380.0002
746.7000	9690.0000	6440.0002
746.8000	9795.0000	6500.0002
746.9000	9900.0000	6560.0002
747.0000	10005.0000	6620.0002
747.1000	10110.0000	6680.0002
747.2000	10215.0000	6740.0002
747.3000	10320.0000	6800.0002
747.4000	10425.0000	6860.0002
747.5000	10530.0000	6920.0002
747.6000	10635.0000	6980.0002
747.7000	10740.0000	7040.0002
747.8000	10845.0000	7100.0002
747.9000	10950.0000	7160.0002
748.0000	11055.0000	7220.0002
748.1000	11160.0000	7280.0002
748.2000	11265.0000	7340.0002
748.3000	11370.0000	7400.0002
748.4000	11475.0000	7460.0002
748.5000	11580.0000	7520.0002
748.6000	11685.0000	7580.0002
748.7000	11790.0000	7640.0002
748.8000	11895.0000	7700.0002
748.9000	12000.0000	7760.0002
749.0000	12105.0000	7820.0002
749.1000	12210.0000	7880.0002
749.2000	12315.0000	7940.0002
749.3000	12420.0000	8000.0002
749.4000	12525.0000	8060.0002
749.5000	12630.0000	8120.0002
749.6000	12735.0000	8180.0002
749.7000	12840.0000	8240.0002
749.8000	12945.0000	8300.0002
749.9000	13050.0000	8360.0002
750.0000	13155.0000	8420.0002
750.1000	13260.0000	8480.0002
750.2000	13365.0000	8540.0002
750.3000	13470.0000	8600.0002
750.4000	13575.0000	8660.0002
750.5000	13680.0000	8720.0002
750.6000	13785.0000	8780.0002
750.7000	13890.0000	8840.0002
750.8000	13995.0000	8900.0002
750.9000	14100.0000	8960.0002
751.0000	14205.0000	9020.0002
751.1000	14310.0000	9080.0002
751.2000	14415.0000	9140.0002
751.3000	14520.0000	9200.0002
751.4000	14625.0000	9260.0002
751.5000	14730.0000	9320.0002
751.6000	14835.0000	9380.0002
751.7000	14940.0000	9440.0002
751.8000	15045.0000	9500.0002
751.9000	15150.0000	9560.0002
752.0000	15255.0000	9620.0002
752.1000	15360.0000	9680.0002
752.2000	15465.0000	9740.0002
752.3000	15570.0000	9800.0002
752.4000	15675.0000	9860.0002
752.5000	15780.0000	9920.0002
752.6000	15885.0000	9980.0002
752.7000	15990.0000	10040.0002
752.8000	16095.0000	10100.0002
752.9000	16200.0000	10160.0002
753.0000	16305.0000	10220.0002
753.1000	16410.0000	10280.0002
753.2000	16515.0000	10340.0002
753.3000	16620.0000	10400.0002
753.4000	16725.0000	10460.0002
753.5000	16830.0000	10520.0002
753.6000	16935.0000	10580.0002
753.7000	17040.0000	10640.0002
753.8000	17145.0000	10700.0002
753.9000	17250.0000	10760.0002
754.0000	17355.0000	10820.0002
754.1000	17460.0000	10880.0002
754.2000	17565.0000	10940.0002
754.3000	17670.0000	11000.0002
754.4000	17775.0000	11060.0002
754.5000	17880.0000	11120.0002
754.6000	17985.0000	11180.0002
754.7000	18090.0000	11240.0002
754.8000	18195.0000	11300.0002
754.9000	18300.0000	11360.0002
755.0000	18405.0000	11420.0002
755.1000	18510.0000	11480.0002
755.2000	18615.0000	11540.0002
755.3000	18720.0000	11600.0002
755.4000	18825.0000	11660.0002
755.5000	18930.0000	11720.0002
755.6000	19035.0000	11780.0002
755.7000	19140.0000	11840.0002
755.8000	19245.0000	11900.0002
755.9000	19350.0000	11960.0002
756.0000	19455.0000	12020.0002
756.1000	19560.0000	12080.0002
756.2000	19665.0000	12140.0002
756.3000	19770.0000	12200.0002
756.4000	19875.0000	12260.0002
756.5000	19980.0000	12320.0002
756.6000	20085.0000	12380.0002
756.7000	20190.0000	12440.0002
756.8000	20295.0000	12500.0002
756.9000	20400.0000	12560.0002
757.0000	20505.0000	12620.0002
757.1000	20610.0000	12680.0002
757.2000	20715.0000	12740.0002
757.3000	20820.0000	12800.0002
757.4000	20925.0000	12860.0002
757.5000	21030.0000	12920.0002
757.6000	21135.0000	12980.0002
757.7000	21240.0000	13040.0002
757.8000	21345.0000	13100.0002
757.9000	21450.0000	13160.0002
758.0000	21555.0000	13220.0002
758.1000	21660.0000	13280.0002
758.2000	21765.0000	13340.0002
758.3000	21870.0000	13400.0002
758.4000	21975.0000	13460.0002
758.5000	22080.0000	13520.0002
758.6000	22185.0000	13580.0002
758.7000	22290.0000	13640.0002
758.8000	22395.0000	13700.0002
758.9000	22500.0000	13760.0002
759.0000	22605.0000	13820.0002
759.1000	22710.0000	13880.0002
759.2000	22815.0000	13940.0002
759.3000	22920.0000	14000.0002
759.4000	23025.0000	14060.0002
759.5000	23130.0000	14120.0002
759.6000	23235.0000	14180.0002
759.7000	23340.0000	14240.0002
759.8000	23445.0000	14300.0002
759.9000	23550.0000	14360.0002
760.0000	23655.0000	14420.0002
760.1000	23760.0000	14480.0002
760.2000	23865.0000	14540.0002
760.3000	23970.0000	14600.0002
760.4000	24075.0000	14660.0002
760.5000	24180.0000	14720.0002
760.6000	24285.0000	14780.0002
760.7000	24390.0000	14840.0002
760.8000	24495.0000	14900.0002
760.9000	24600.0000	14960.0002
761.0000	24705.0000	15020.0002
761.1000	24810.0000	15080.0002
761.2000	24915.0000	15140.0002
761.3000	25020.0000	15200.0002
761.4000	25125.0000	15260.0002
761.5000	25230.0000	15320.0002
761.6000	25335.0000	15380.0002
761.7000	25440.0000	15440.0002
761.8000	25545.0000	15500.0002
761.9000	25650.0000	15560.0002
762.0000	25755.0000	15620.0002
762.1000	25860.0000	15680.0002
762.2000	25965.0000	15740.0002
762.3000	26070.0000	15800.0002
762.4000	26175.0000	15860.0002
762.5000	26280.0000	15920.0002
762.6000	26385.0000	15980.0002
762.7000	26490.0000	16040.0002

19.50	DISCHG	533.97	499.08	468.16	432.21	412.26	107.10	103.74	102.22	522.57	503.92
19.50	FLEV	738.73	738.66	738.59	738.53	738.47	738.42	738.36	738.32	738.27	738.23
22.00	DISCHG	286.02	266.63	248.24	231.53	216.42	202.94	190.84	179.81	159.77	148.64
22.00	FLEV	738.20	738.14	738.09	738.05	738.01	737.97	737.94	737.91	737.87	737.86
24.50	DISCHG	151.46	141.32	133.02	128.20	123.38	114.40	105.53	102.01	104.55	100.26
24.50	FLEV	737.84	737.81	737.79	737.77	737.76	737.74	737.72	737.71	737.70	737.68
27.00	DISCHG	96.14	92.18	88.39	84.73	81.26	77.22	74.71	70.33	63.83	61.01
27.00	FLEV	737.67	737.65	737.64	737.63	737.62	737.61	737.60	737.58	737.56	737.54

TOTAL WATER, IN INCHES ON UNSATURATED AREA= 5.4716 CFS=IRSE ACNE-IT= 400.55

ENDCMP 1